

A revision of the spider genus *Cocalus* (Araneae: Salticidae)

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Introduction

Cocalus Koch 1846 is a small genus of oriental and Australian Salticidae comprised of four known species, one of which is described here as new. Although the type species, *Cocalus concolor* Koch, is only known from a single adult male which has lost both palps, it is thought the low elevation on the carapace, shared by all species is sufficiently characteristic to unite the species here included in *Cocalus*. In the only known female (*C. murinus* Simon) the epigyne is dark with a median orifice and is not especially characteristic when compared with epigyines of related genera. However, the male palps (in the two species, *C. gibbosus* sp.n., and *C. limbatus* Thorell, for which these are known) are distinctive, the sinuous finger-like protuberance of the tibiae being, as far as I am aware, unique within the Salticidae.

Opisthoncus Koch from Australia is the only other genus known to the author to have a similar elevation on the carapace. It does not, however, appear to be closely related to *Cocalus* as the eye patterns are different, the elevation is situated between the posterior lateral eyes and the palps are less complex. The biology of *Cocalus* is unknown.

The standard abbreviations and measurements are those used by Wanless (1978*a*), but for the leg spination the system adopted is that used by Platnick and Shadab (1975).

Genus *COCALUS* Koch

Cocalus Koch, 1846: 180, 230. Type species *Cocalus concolor* Koch, by subsequent designation (Simon, 1901: 408). Koch, 1850: 48. Marschall, 1873: 393. Scudder, 1882: 72. Peckham & Peckham, 1885: 266, 288. Simon, 1901: 405, 407, 408. Sherborn, 1922: 1375; 1932: 345.

Petrunkévitch, 1928: 181. Neave, 1939, I: 778. Roewer, 1954: 934. Bonnet, 1956: 1173.

Cocala: Simon, 1864: 327, [lapsus calami]. Waterhouse, 1912: 61. Neave, 1939 I: 778.

DEFINITION. Medium to large spiders ranging from about 7.5 to 8.6 mm in length. Sexual dimorphism not marked. *Carapace*: characteristic of genus, profile generally as in Figs 2A, B; 3A, B; moderately high, longer than broad, widest between coxae II–III, lateral margins usually with membraneous margin; fovea moderately long, situated just behind posterior lateral eyes; positioned centrally within posterior ocular quadrangle a small bump (arrowed in Fig. 2A, B, E). *Eyes*: set on moderately well developed tubercles, with black surrounds that are normally covered in hairs; arranged in three transverse rows comprised of anterior medians and anterior laterals, posterior medians, and posterior laterals; anteriors subcontiguous with apices strongly procurved in frontal view and recurved in dorsal view; anterior medians largest, anterior laterals about half diameter of anterior medians; posterior medians relatively large, positioned more or less midway between anterior laterals and posterior laterals and outside optical axis of anterior laterals; posterior laterals about as large as anterior laterals, set close to lateral margins of carapace when viewed from above; quadrangle formed by posterior median and posterior lateral eyes broader than long and widest posteriorly; entire quadrangle (measured from between bases of anterior medians to posterior margins of posterior lateral eyes) occupying between 45 and 47 per cent of carapace length. *Clypeus*: between 32 and 64 per cent of diameter of anterior median eyes, usually clothed in hairs. *Chelicerae*: robust, more or less parallel, slightly inclined anteriorly;

promargin with three teeth, retromargin with four or five. *Maxillae and labium*: more or less as in Fig. 3D; bases usually obscured by coxae I. *Sternum*: elongate scutiform, generally as in Fig. 3E. *Coxae*: robust; coxae IV largest, others subequal. *Pedicel*: short. *Abdomen*: long and tapered; spinnerets long, posteriors robust and almost twice as long as robust anteriors, medians slender and slightly shorter than anteriors; anal tubercle a well developed cone; tracheal system not examined; spiracle an indistinct transverse slit near base of anterior spinnerets; former position of colulus apparently indicated by patch of hairs. *Legs*: moderately long and robust; spines strong and numerous; legs I sometimes with scanty ventral fringes on metatarsi and tibiae, also minute ventral setae on tarsi and metatarsi (c.f. *Portia* Karsch); claws pectinate, tufts present, scopulae absent. *Female palps*: moderately long and robust with terminal claw. *Male palps*: large, moderately complex and morphologically similar; densely clothed in hairs (not always shown in figures). Tibiae with truncate ventral apophysis and large retrolateral apophysis containing a sinuous finger-like protuberance of the tibiae (Fig. 4C); cymbium with basal retrolateral lobe; embolus (e) robust, arising from distal end of tegulum and curving inwards towards the alveolar cavity; near embolic base an indistinct sclerite (a), also arising from embolic base a translucent lobe (l); tegulum (t) ovoid with tegular furrow (f), retrolateral striae and dark peripheral seminal ducts (Fig. 40). *Epigyne*: large and dark, median orifice plugged in specimen examined. Internal structure not examined.

REMARKS. Platnick (pers. comm.) suggested that the tegular furrow of *Phaeacius* (see Wanless, 1981) and related genera may contain pores, as the furrow and striae resembled distribution channels which may spread a secretion over the surface of the tegulum (Fig. 1A, B). A re-examination of the male palp of *Phaeacius fimbriatus* Simon, confirmed Platnick's suggestion by showing the presence of a single minute pore in the wall of the furrow (position arrowed in Fig. 1A). The pore, which seems disproportionately small in relation to the size of the furrow, cannot be resolved with the stereoscopic microscope. Unfortunately there is insufficient material to confirm the presence of pores in *Cocalus*.

AFFINITIES AND DIAGNOSIS. *Cocalus* belongs to a group of genera in which the male palps are characterized by the presence of a tegular furrow and truncate or obtuse apophysis of the venter of the tibiae. It is readily distinguished from other genera of this group (i.e. *Boethus* Thorell, *Brettus* Thorell, *Codeta* Simon, *Cyrba* Simon, *Phaeacius* Simon and *Portia* Karsch) by the presence of an elevation in the posterior ocular quadrangle (Fig. 2A, B, E).

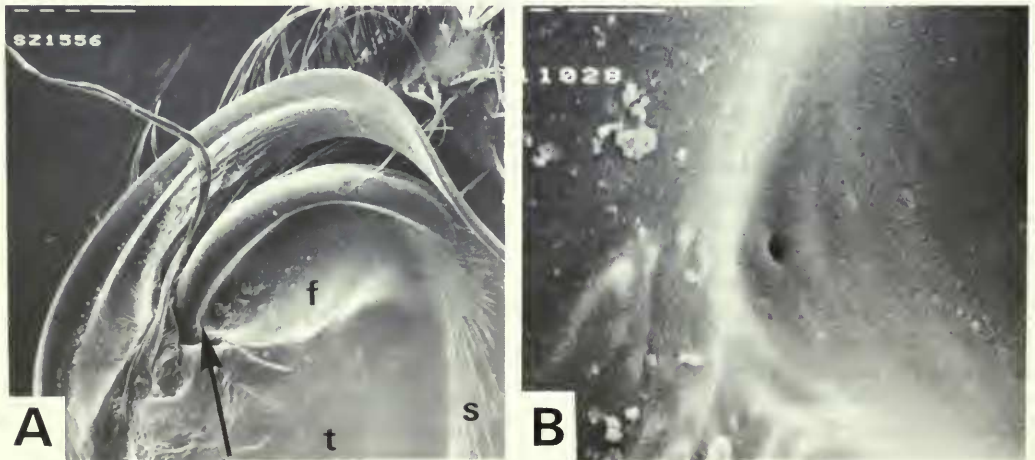


Fig. 1 *Phaeacius lancearius* (Thorell), ♂ palp: A, apical region, $\times 60$, showing tegulum (t), tegular furrow (f) and striae (s); location of pore indicated by arrow. B, pore in wall of tegular furrow, $\times 1200$.

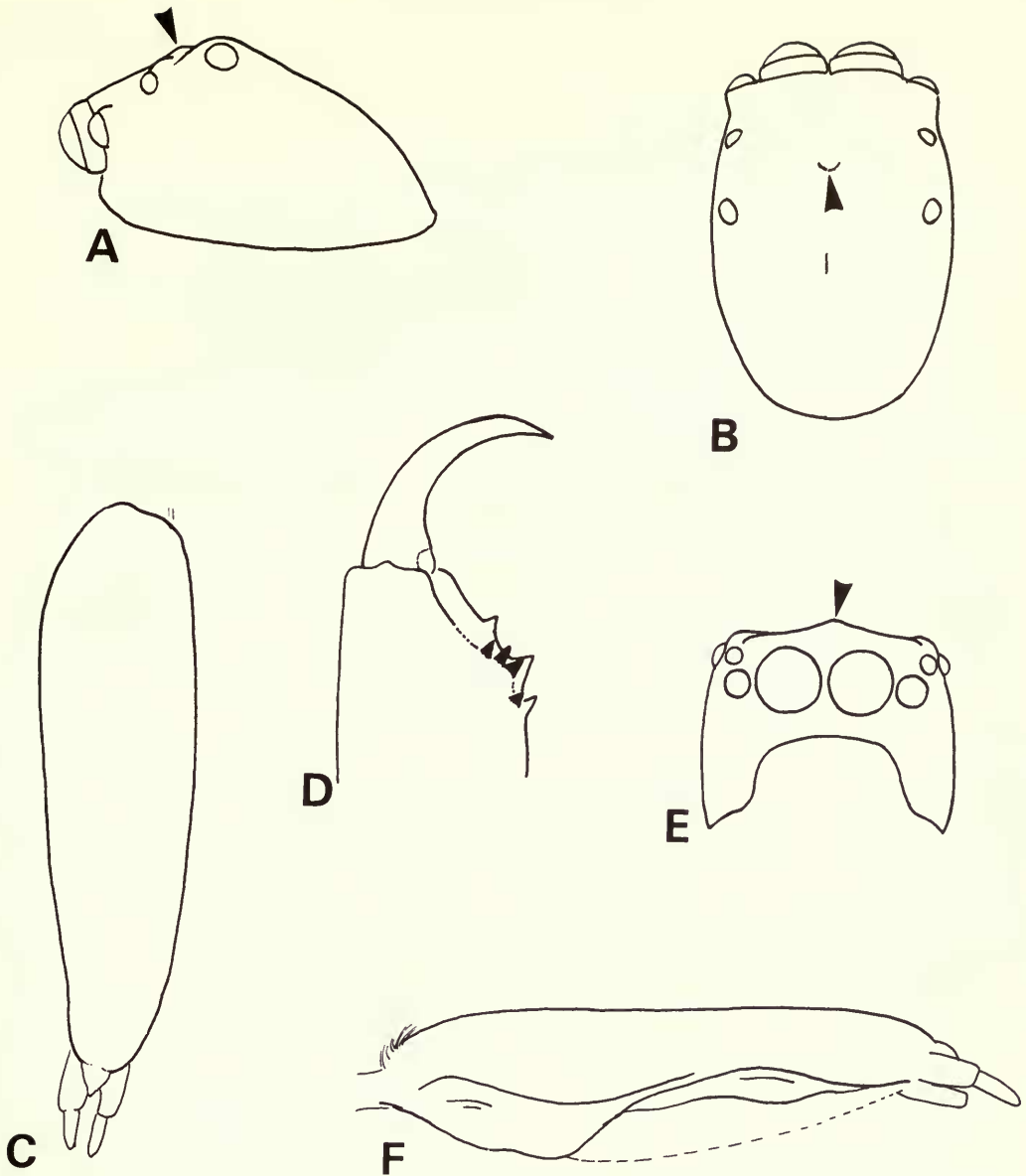


Fig. 2 *Cocalus concolor* Koch, holotype ♂: A, carapace, lateral; B, carapace, dorsal; C, abdomen, dorsal; D, chelicera, inner view; E, carapace, facies; F, abdomen, lateral.

List of species in the genus *Cocalus* Koch, 1846

Cocalus concolor Koch, 1846

C. gibbosus sp. n.

C. limbatus Thorell, 1878

C. murinus Simon, 1899

Summary of taxonomic changes effecting species listed in the catalogues of Roewer (1954) and Bonnet (1956) as belonging in *Cocalus*.

Cocalus africanus Thorell, junior synonym of *Portia africana* (Simon) (Wanless 1978b)

Cocalus lancearius Thorell, transferred into *Phaeacius* Simon (Roewer 1954), redescribed (Wanless 1981).

Cocalus longipes Thorell, *Cocalus macellus* Thorell and *Cocalus protervus* Thorell all belong in *Cocalodes* Pocock, **comb. n.**

Cocalus salax Thorell, belongs in *Codeta* Simon, **comb. n.**

The synonyms listed by Bonnet (1956) are accepted, but for one species, *Phaeacius ramipalpis* (Thorell) which evidently belongs in *Boethus* (see Wanless 1981). *Cocalodes*, *Codeta* and *Boethus* are presently being revised by the author.

Cocalus concolor Koch

(Fig. 2A–F)

Cocalus concolor Koch, 1846 : 180, ♂. Holotype ♂, Indonesia, Bintang Island (MNHU, Berlin) [examined]. Koch, 1850 : 49. Thorell, 1892 : 475. Simon, 1896 : 351; 1901 : 407, 408. Rainbow, 1898 : 352. Petrunkevitch, 1928 : 181. Roewer, 1954 : 935, Bonnet, 1956 : 1173. Prószyński, 1971 : 390. Wanless, 1978b : 85.

Cocala concolor: Simon, 1864 : 327. [lapsus calami].

DIAGNOSIS. The holotype of this species, a male in poor condition, has no palps and a diagnosis cannot be given at the present time.

FEMALE. Unknown, but *C. murinus* Simon from Sumatra may belong here.

MALE HOLOTYPE. In poor condition with carapace and legs translucent. *Carapace* (Fig. 2A, B): brown, irregularly clothed in recumbent white hairs; punctate with iridescent violet sheen in eye region. *Eyes* (Fig. 2A, B, E). *Clypeus*: with light brownish hairs below AM, densely white haired below AL. *Chelicerae*: dark brown with long light brown and black hairs; teeth as in Fig. 2D. *Maxillae, labium and sternum*: more or less as in *C. murinus* (Fig. 3D, E); brownish. *Abdomen* (Fig. 2C, F): dark brown. *Legs*: detached, some missing; brownish. *Palps*: missing.

Dimensions (mm): total length *c.* 7.5; carapace length 3.0, breadth 2.12, height 1.82; abdomen length 4.48; eyes, anterior row 1.9, middle row 1.90, posterior row 1.96; quadrangle length 1.42. *Ratios*: AM : AL : PM : PL :: 14 : 7.5 : 5 : 7; AL–PM–PL :: 12–11.5; AM : CL :: 14 : 8.

DISTRIBUTION. Indonesia, Bintang Island.

MATERIAL EXAMINED. Holotype ♂, data given in synonymy.

REMARKS. Rainbow (1898) records this species from British New Guinea, but gives no details as to the precise locality, neither does he indicate the sex of the specimen concerned. For the present it seems best to regard this record with caution and not formally include it in the distribution list.

Cocalus murinus Simon

(Fig. 3A–E)

Cocalus murinus Simon, 1899 : 102, ♀. LECTOTYPE ♀ (here designated) Indonesia, Sumatra (MNHN, Paris) [examined]. Simon, 1901 : 406, 407. Roewer, 1954 : 934. Bonnet, 1956 : 1173. Prószyński, 1971 : 391.

DIAGNOSIS. Other females of *Cocalus* are unknown and a diagnosis cannot be given at the present time. Previous studies on *Portia* and *Phaeacius* suggest that the epigynes of *Cocalus* may be difficult to distinguish from one another.

MALE. Unknown, but possibly synonymous with the type species *C. concolor* from Bintang Island.

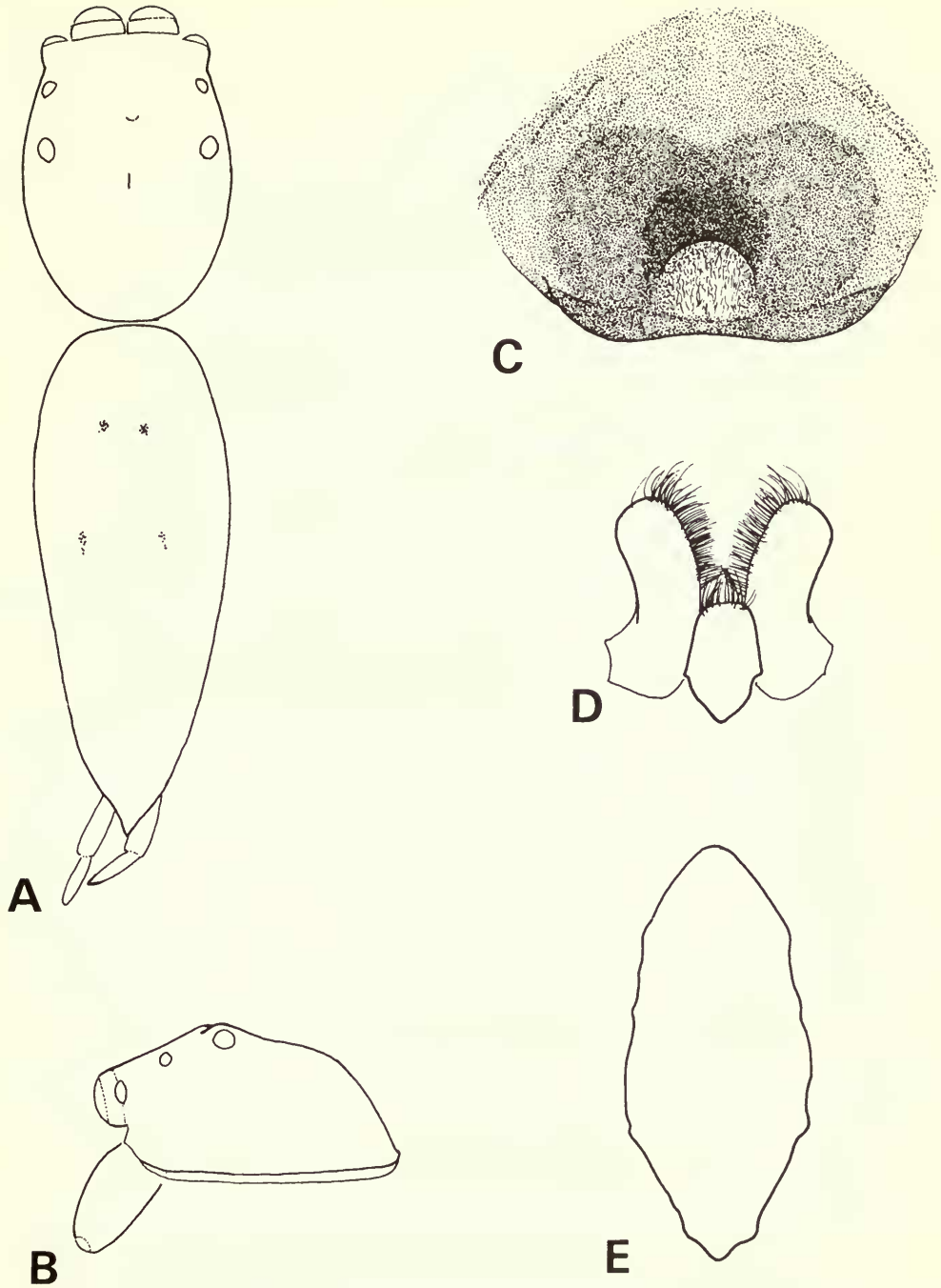


Fig. 3 *Cocalus murinus* Simon, lectotype ♀: A, dorsal view; B, carapace, lateral; C, epigyne; D, maxillae and labium; E, sternum.

FEMALE LECTOTYPE. In fair condition. *Carapace* (Fig. 3A, B): amber with vague markings radiating from foveal region; irregularly clothed in short recumbent white hairs (rubbed). *Eyes*: with black surrounds, fringed in white hairs. *Clypeus*: clothed in long white hairs. *Chelicerae*: amber, shiny with long white hairs basally; promargin with three teeth, retromargin with five. *Maxillae and labium* (Fig. 3D): orange-brown with inner maxillae margins and labial tip yellowish. *Sternum* (Fig. 3E): yellow-brown tinged black, shiny; clothed in long coarse white hairs and fine pale brown ones. *Abdomen*: rubbed; dull whitish yellow with sooty lateral markings, pattern indistinct; spinnerets yellow-brown. *Legs*: pale amber to light yellowish orange; spination of legs I: metatarsi v 2-0-0, p 0-1-0, d 2-1-1, r 0-1-0; tibiae v 2-2-2, p 1-0-1, d 1-1-1, r 1-0-1; patellae p 1-0-0, r 1-0-0; femora d 0-2-4. *Palp*: light yellowish orange to pale amber. *Epigyne* (Fig. 3C): dark amber clothed in creamy hairs, orifice indistinct and evidently plugged.

Dimensions (mm): total length 8.56; carapace, length 3.36, breadth 2.52, height 1.88; abdomen length 5.6; eyes, anterior row 1.96, middle row 2.02, posterior row 2.16; quad-angle length 1.54. *Ratios*: AM : AL : PM : PL :: 15.5 : 8 : 5 : 8; AL-PM-PL :: 12-12.5; AM : CL :: 15.5 : c. 5 (too hairy for accurate measurement).

DISTRIBUTION. Indonesia, Sumatra.

MATERIAL EXAMINED. Lectotype ♀, Sumatra (*J.-L. Weyers*) (MNHN, Paris, 16290).

Cocalus gibbosus sp. n.

(Fig. 4A-D)

DIAGNOSIS. Similar to *C. limbatus*, but distinguished by the truncate dorsal prong of the retrolateral tibial apophysis (Fig. 4C).

FEMALE. Unknown.

MALE HOLOTYPE. In good condition. *Carapace* (Fig. 4A, B): dark orange-brown; clothed in short recumbent white hairs. *Eyes*: with black surrounds except AM; fringed in whitish hairs. *Clypeus*: covered in dark grey hairs below AM with whitish hairs below AL. *Chelicerae*: dark orange-brown, sparsely covered in fine black hairs; promargin with three teeth, retromargin with four. *Maxillae*: brownish with dull white inner margins. *Labium*: dark brown tipped dull white. *Sternum*: brownish with black hairs. *Abdomen*: dorsally orange-brown to greyish brown, clothed in short recumbent white hairs (rubbed); pattern indistinct; venter dark greyish with vague longitudinal rows of lighter spots, clothed in short black hairs. *Legs*: generally orange-brown with whitish, and black hairs; spination of legs I: metatarsi v 2-0-0, p 1-1-0, d 0-1-1, r 1-1-0; tibiae v 2-2-2, p 1-1-0, d 1-1-1, r 2-1-0; patellae p 1-0-0, r 1-0-0; femora p 0-0-1, d 0-2-3. *Palp* (Fig. 4C, D): similar to that of *C. limbatus*, clothed in white hairs.

Dimensions (mm): total length 8.16; carapace, length 3.0, breadth 2.28, height 1.88; abdomen length 5.04; eyes, anterior row 1.78, middle row 1.88, posterior row 2.0; quad-angle length 1.38. *Ratios*: AM : AL : PM : PL :: 14 : 7 : 4.5 : 7; AL-PM-PL :: 14 : 9.

DISTRIBUTION. Australia.

MATERIAL EXAMINED. Holotype ♂, Australia, Lockerbie, N. Queensland (*R. Raven*) 30.i-1.ii.1975 Queensland Museum, reg. no. QM S846.

Cocalus limbatus Thorell

(Fig. 5A-D)

Cocalus limbatus Thorell, 1878 : 283, 311, ♂. Holotype ♂, Amboina (MCSN, Genova) [examined]. Thorell, 1881 : 492, 706. Simon, 1901 : 407. Roewer, 1954 : 934. Bonnet, 1956 : 1173. Prószyński, 1971 : 391.

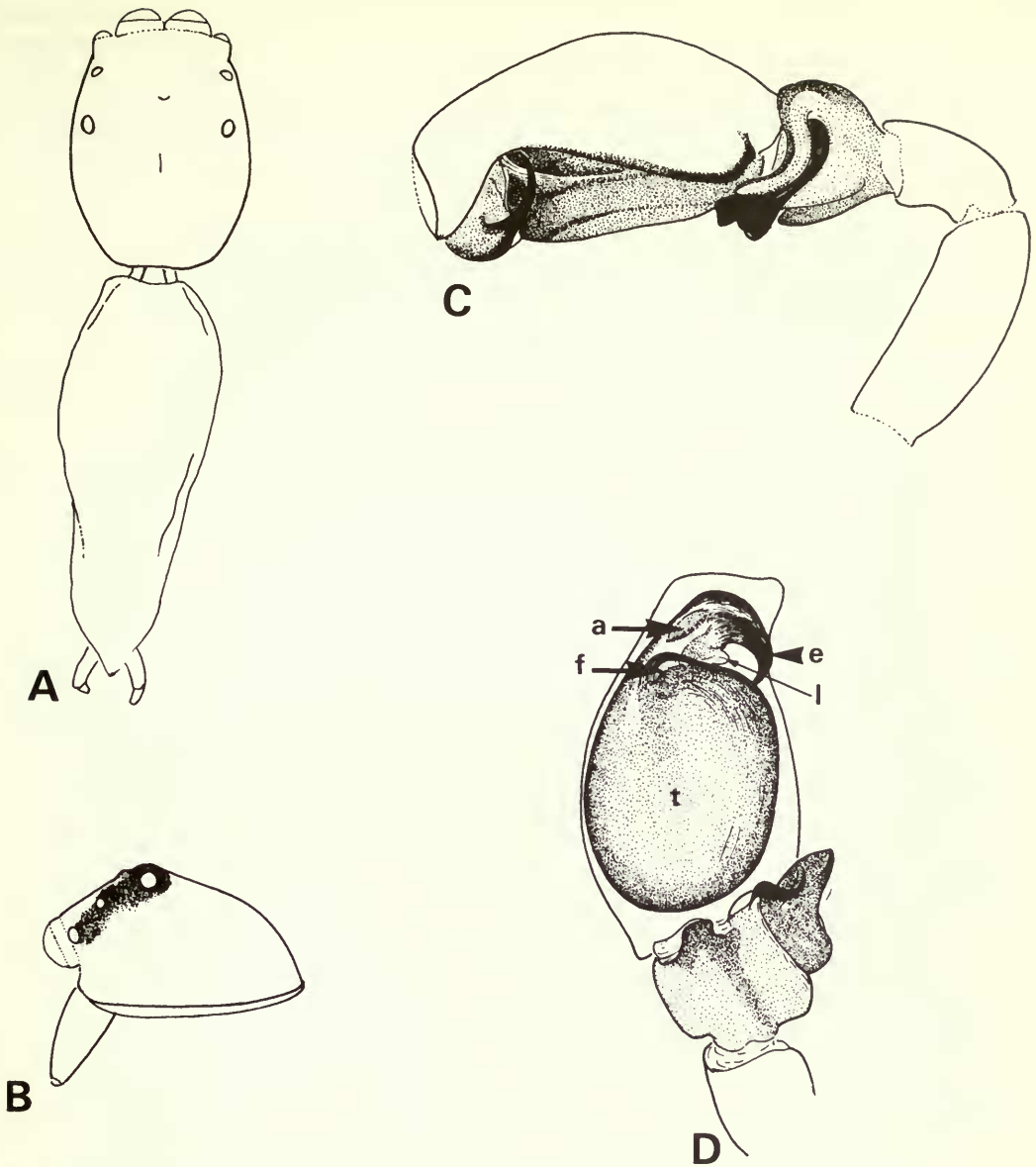


Fig. 4 *Cocalus gibbosus* sp. n., holotype ♂: A, dorsal view; B, carapace, lateral; C, palp, retro-lateral; D, palp, ventral. Abbreviations: a, sclerite; e, embolus; l, lobe; f tegular furrow; t tegulum.

DIAGNOSIS. Similar to *C. gibbosus*, but distinguished by the obtuse dorsal prong of the retrolateral tibial apophysis (Fig. 5C).

FEMALE. Unknown.

MALE HOLOTYPE. In fair condition. *Carapace* (Fig. 5A, B): amber to dark amber, irregularly clothed in whitish pubescent hairs (rubbed). *Eyes*: with black surrounds except AM; fringed in whitish hairs. *Clypeus*: fringed in light brownish hairs below AM with white hairs below AL. *Chelicerae*: dark amber; thinly covered in pale amber hairs; teeth not examined. *Maxillae*: brownish amber with inner distal margins yellowish. *Labium*: dark amber.

Sternum: partly obscured by coxae, apparently similar in form to that of *C. murinus*; dark amber with pale amber hairs. *Abdomen*: dull brownish amber lightly tinged black (original markings bleached); a tuft of pale amber hairs anteriorly, otherwise irregularly covered in dull whitish hairs. *Legs*: generally amber; spination of legs I: metatarsi v 1-0-0, p 1-0-0, d 2-1-1, r 0-1-0; tibiae v 2-2-2, d 2-2-1, r 1-0-0; patellae p 1-0-0, r 1-0-0; femora d 0-2-4. *Palp* (Fig. 5C, D): the protuberance resting within the 'bowl' of the retrolateral tibial apophysis is slightly shorter than that found in *C. gibbosus*.

Dimensions (mm): total length 7.44; carapace, length 2.94, breadth 2.28, height 1.8; abdomen length 4.52; eyes, anterior row 1.92, middle row 1.96, posterior row 2.06; quad-angle length 1.4. *Ratios*: AM:AL:PM:PL::16:8:5:7; AL-PM-PL::11-11; AM:CL::16:6.

DISTRIBUTION. Indonesia, Amboina.

MATERIAL EXAMINED. Holotype ♂, data given in synonymy.

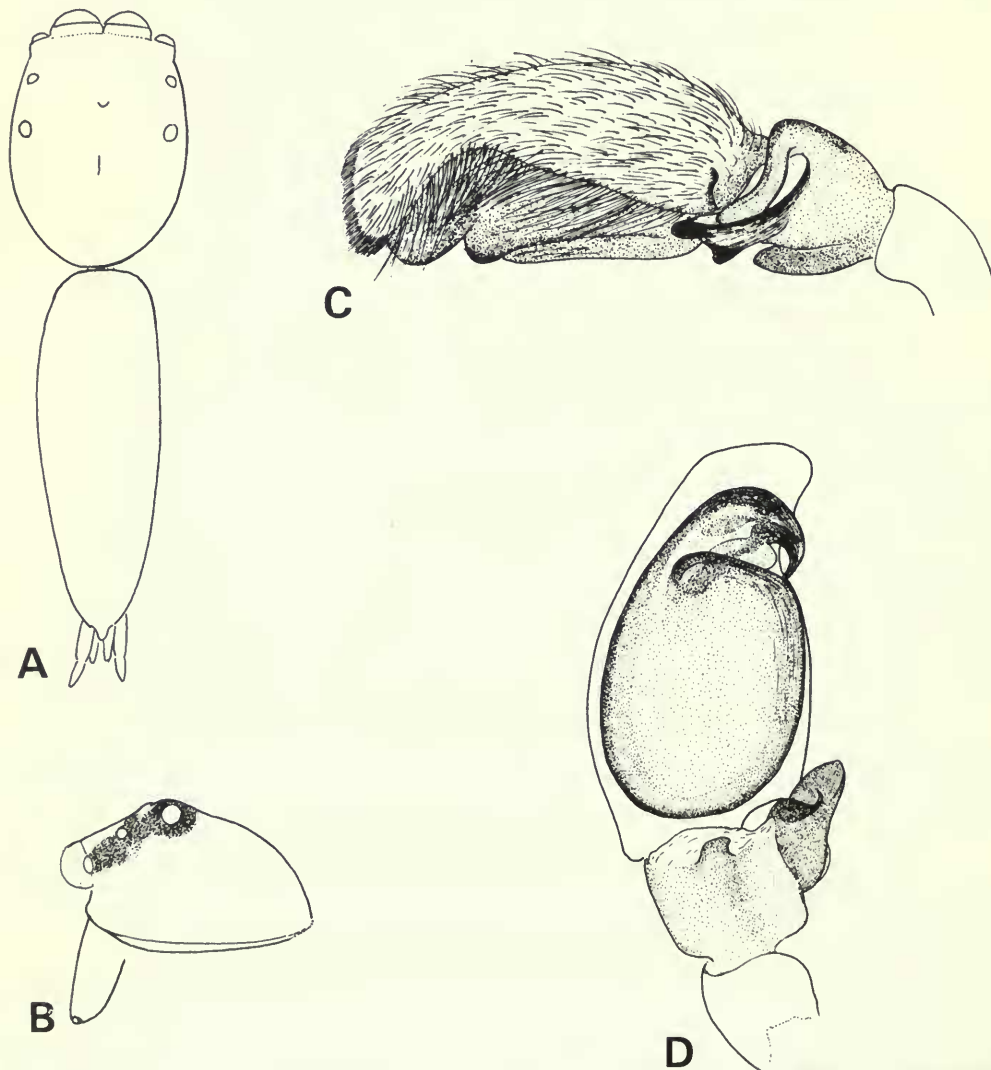


Fig. 5 *Cocalus limbatus* Thorell, holotype ♂: A, dorsal view; B, carapace, lateral; C, palp, retro-lateral; D, palp, ventral.

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